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ENDANGERED SPECIES

Technical Bulletin

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The Return of Thick-billed Parrots to Arizona

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(Editor's note: Restoring a rare species is seldom an easy or straightforward task, especially if it involves reintroduction. The factors that led to the original decline must be addressed, and locating suitable, protected habitat can be difficult. Research into new captive propagation and reintroduction techniques also may be necessary. The following article shows, however, that hard work and patience can be rewarded. With private and Federal assistance, the State of Arizona is achieving success in its program to reclaim a unique part of its wildlife heritage.)

The thick-billed parrot (*Rhynchopsitta pachyrhyncha*) is one of two species of psittacines native to the continental United States, and the only one that survives. By no stretch of the imagination is the thick-bill a tropical bird; it occurs in temperate conifer and mixed deciduous-conifer forests. Thick-bills feed primarily on conifer cones and, to a lesser extent, on acorns and juniper berries. In winter, they inhabit areas with overnight temperatures usually dropping far below freezing. It is an odd but accurate image: a parrot that can be seen in the snow zone.

There are no historical breeding records for thick-billed parrots north of Mexico, but there are virtually none for Mexico either during the period when these birds still occurred in the United States. Thus, it seems logical that the absence of breeding records is merely an observational artifact and does not prove anything about the species' previous breeding range. None of the early naturalists visiting Arizona or New Mexico is known to have tried to locate their nests. Most information on thick-bills in the wild came from incidental observations by ranchers, loggers, and casual naturalists.

Historically, thick-bills occasionally made irruptive movements (i.e., unpredictable movements in large numbers) into Arizona and New Mexico from Mexico, most notably during the extreme drought of 1917-1918. Our interviews of elderly Arizonans who had seen thick-billed parrots in the earlier part of this century indicate that in the Chiricahua Mountains of southeastern Arizona the birds were also once regular seasonal residents, not just occasional visitors. The fact that this parrot still breeds within about 90 miles (150 kilometers) of the Arizona border (Lanning and Shiflett 1983) indicates a reasonable possibility it was once a breeding species in the United States.

Disappearance of the Thick-bills

Thick-billed parrots effectively disappeared from the United States early in the 1900's. The species does survive, although in dwindling numbers, in the Sierra Madre of western Mexico, and it is listed there as Endangered. The cause of its disappearance from the United States is not well known. Our conversations with long-time Arizona residents indicate subsistence hunting by miners and woodsmen may have been a primary cause of the parrot's disappearance. Habitat loss, due to extensive cutting of the mountain forests to support the mining industry (roof props for mine tunnels and ties for railroad tracks), also may have been a factor in the extirpation of the species in this country. Further, some people have speculated that the disappearance of the imperial woodpecker (*Campephilus imperialis*) from these same montane forests may have reduced the number of available nesting cavities for the parrots. Naturally occurring cavities also are probably not as abundant as in pre-cutting days because there are fewer old trees.

With a reduction in the human activities that may have eliminated thick-bills from

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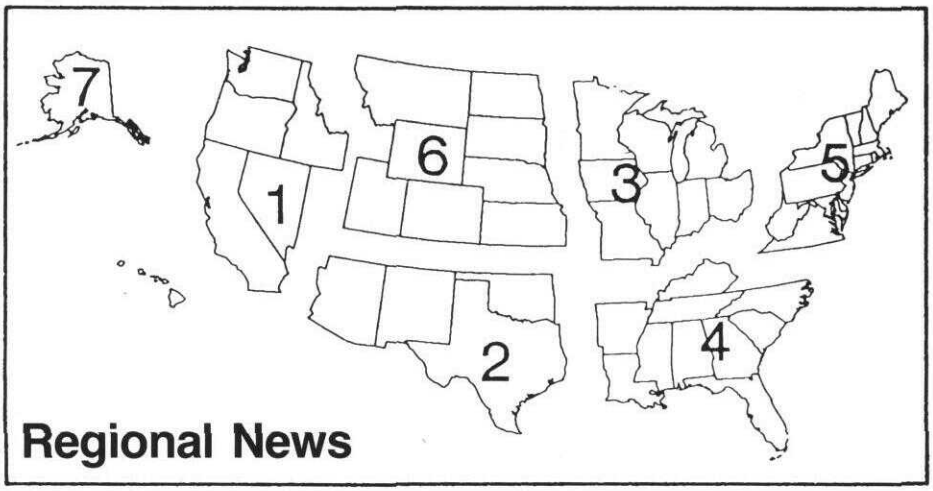
photo by Terry B. Johnson

Adult thick-billed parrots typically are about 16 inches (40 centimeters) in total length and have a wingspan of 8 to 10 inches (20 to 25 cm). They are mostly green except for red patches on the foreparts of the head and wings. In flight, they show a yellow stripe on the underwings.



Regional News

Regional endangered species biologists have reported the following news:

Region 2 — In January and February, volunteers from the Arizona Native Plant Society transplanted about 350 Endangered Tumamoc globe-berry (*Tumamoca macdougalii*) plants onto a preserve near Tucson. The transplants were started from seed 3 years ago and grown in containers at the Arizona-Sonora Desert Museum. The Service hopes these plants will survive and thus supplement the population that was partially lost due to construction of a Central Arizona Project canal.

* * *

Volunteers from the Arizona Native Plant Society also transplanted 105 Endangered Kearney's blue-star (*Amsonia kearneyana*) container-grown plants into a canyon on the east side of the Baboquivari Mountains. These plants will supplement the 38 survivors of an April 1988 transplant project at the same canyon. The survival of the species in the wild may depend on this transplanted population; only eight plants remain in the single natural population.

* * *

The Southwestern Bald Eagle Nest Watch Program began another year with 16 nest watchers. These people observe the eagles (*Haliaeetus leucocephalus*) from dawn to dusk while collecting data on nest activities and interactions with other wildlife species and humans. They also enforce the breeding area closures and can rescue nestlings that have accidentally fallen from their nests.

* * *

The Service, in cooperation with the Bureau of Land Management, Army Corps of Engineers, Arizona Game and Fish Department, and Arizona State Parks, plans to open a public viewing station at the Alamo Lake bald eagle breeding area this spring. For the first time in Arizona, visitors will have a place to watch eagles from a distance that will avoid disturbances to the birds.

* * *

The Sierra Club Legal Defense Fund, acting on behalf of the Natural Audubon Society and Coastal Bend Audubon Society, has notified the Army Corps of Engineers of its intent to file suit unless the Corps initiates formal Endangered Species Act/Section 7 consultation with the Service over planned maintenance dredging of the Gulf Intracoastal Waterway.

Of particular concern is dredging within critical habitat of the whooping crane (*Grus americana*). The problems that need to be addressed are: 1) finding environmentally acceptable locations for dredge spoil disposal; 2) preventing contaminants in bottom sediments from entering aquatic food chains; and 3) stopping the erosion of whooping crane hab-

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Correction

The caption for the Mariana flying fox (*Pteropus mariannus mariannus*) photo in BULLETIN Vol. XIV, Nos.1-2, should have read that the Service considers this bat a category 1 listing candidate in the southern Mariana Islands and a category 2 candidate to the north.

Regional News

(continued from previous page)

itat along the waterway. The Corps has acknowledged that marshland adjacent to the waterway is eroding at rates up to 3 feet (1 meter) annually, but the Corps says it lacks funding authority to provide erosion protection.

* * *

Region 4 — The Fish and Wildlife Service, Arkansas Natural Heritage Commission, and U.S. Forest Service will conduct a status survey and habitat investigation for the Rich Mountain slitmouth (*Stenotrema pilsbryi*), a category 1 candidate snail, on Rich Mountain and Black Fork Mountain in Arkansas and on other mountains in Oklahoma. A survey has been conducted by Dr. Ron Caldwell on the Oklahoma side of Rich and Black Fork

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National Pesticide Consultation is Extended

On September 30, 1988, the Environmental Protection Agency (EPA) requested formal consultation, in accordance with Section 7 of the Endangered Species Act, on the potential impacts of 108 pesticide registrations on over 160 Endangered and Threatened species. An interim National Pesticide Consultation Team, with Fish and Wildlife Service representatives from Regions 1-6, was appointed to conduct the consultation. (See story in BULLETIN Vol. XIV, Nos. 1-2.) The team produced a draft Biological Opinion, which is currently under review by EPA and the U.S. Department of Agriculture (USDA). In order to allow for the consideration of additional data supplied by EPA on December 12, 1988, the due date for the Biological Opinion was extended to April 26, 1989. A second extension, until June 9, 1989, has been provided to allow for a detailed review of the reasonable and prudent alternatives identified in the draft Biological Opinion.

On another Section 7 matter, the Service is conducting an informal consultation on USDA's Animal Damage Control Program in anticipation of a request for a formal programmatic consultation. The Service anticipates that the methodology being developed will be suitable for programmatic consultations on other USDA activities.

Agreement Reached on New Manual for Identifying and Delineating Wetlands

In a major step toward improving the conservation of our Nation's wetlands, four Federal agencies with responsibilities in this area recently agreed on the technical basis for identifying and defining wetlands. This agreement is set forth and detailed in the new *Federal Manual for Identifying and Delineating Jurisdictional Wetlands*, produced jointly by the Fish and Wildlife Service, Army Corps of Engineers, Environmental Protection Agency, and Soil and Water Conservation Service. The manual should help Federal agencies assist the administration in implementing its policy that calls for "no net loss" of wetlands.

Of the 215 million acres of wetlands in the conterminous United States when the Pilgrims landed, only 99 million acres—about 46 percent—remained by the 1970's. Surveys by the Fish and Wildlife Service's National Wetlands Inventory indicate that nearly half a million acres of wetlands in the U.S. continue to be lost each year. Once thought of as only swampy wastelands to be drained and filled, wetlands are now increasingly being recognized as a precious natural resource. They filter and clean polluted water, absorb flood waters, provide a variety of recreational opportunities, and are vital habitat for many species of wildlife. The Service estimates, for example, that about half of our nation's endangered animals and almost a third of our endangered plants depend on wetlands for their survival.

The absence of a consistent Federal approach to identifying wetlands and determining their boundaries had long been of concern to developers seeking regulatory decisions on permit applications and to conservationists interested in protecting wetland resources. Confusion over what constitutes a wetland arose because there are many different kinds of wetlands and because the various regulatory agencies have different authorities and responsibilities. The new agreement and manual reconcile longstanding differences in the wetland guidelines used by the four agencies.

Incorporated into the new manual is the Corps of Engineers "3-parameter approach," which uses 1) vegetative composition, 2) soil type, and 3) hydrology to identify an area as a wetland. Under the recent agreement, the hydrology requirement is assumed to be satisfied if an area has typical wetland vegetation growing on hydric soil with no evidence of significant man-made drainage. The practical benefit of this new approach is an improvement in the way that seasonal wetlands (e.g., bottomland hardwood forests, prairie potholes, vernal pools, pocosins) are identified for protection. Even though these areas do not always contain water, seasonal wetlands are very important for maintaining waterfowl and other wildlife, including many endangered species. Habitat protection and/or restoration is vital to the success of endangered species recovery efforts, and the improved wetland definition could give those species that depend on wetlands—particularly seasonal wetlands—a better chance for long-term survival.

The manual is strictly a technical document and has been distributed to involved agencies, which will be meeting regularly to discuss its implementation. After the manual has been used for a year, agency representatives will discuss the need for any modifications.

photo by Robert Ornduff

Baker's sticky seed* (Blennosperma bakeri), *an annual plant, is endemic to vernal pools of the Cotati Valley, Sonoma County, California. The seasonal wetland habitat of this and other listing candidates could benefit from the new agreement for identifying and delineating wetlands

Parrots

(continued from page 1)

Arizona, and with apparently suitable habitat available, it has long seemed desirable to us to attempt to reestablish this native species in the United States. To the south, continued habitat destruction and a recent increase in the capture of thick-bills for the illicit pet trade makes the long-term survival of the species in Mexico questionable. Thus, reestablishing new populations in the United States could enhance overall conservation of the species.

Developing a Release Plan

In 1985 and 1986, an enormous increase in the flow of smuggled thick-bills into the United States was observed by Fish and Wildlife Service law enforcement agents. Nearly all of the birds confiscated by the agents appeared to have been captured as adults, judging from their dark bill color and their familiarity with pine cones. It occurred to Agent Sam Jojola that the confiscated birds might be suitable for an experimental release effort. Being wild-caught adults, they had a relatively high probability for survival in the wild, although some people wondered if they might fly home to Mexico if released in the United States.

The idea of a release effort was very favorably received. After two public hearings were held and an environmental assessment was prepared, the Arizona Game and Fish Department, Fish and Wildlife Service, and Forest Service signed a cooperative agreement to experimentally release thick-billed parrots in Arizona.

The Chiricahua Mountains of southeastern Arizona were chosen as the site for the initial releases. These mountains are largely within the Coronado National Forest, under the jurisdiction of the U.S. Forest Service. The forest is principally managed for recreation, wildlife, and watershed values. Very little timbering has occurred there in recent decades. Most of the early records of thick-bills in the United States came from this area (*Lusk 1900; Phillips et al. 1964; Smith* 1907; Wetmore 1935). The Chiricahuas have a substantial acreage of suitable habitat at elevations of about 6,600 to 9,800 feet (2,000 to 3,000 meters), the principal elevational range at which thick-bills occur in Mexico (Lanning and Shiflett 1983). The higher slopes are cloaked with mature pine-fir-spruce-aspen vegetation, and lower elevations are dominated by various species of oaks mixed with conifers. With a dozen species of conifers and more than half a dozen oaks, the diversity of food available to thick-bills in the Chiricahuas compares favorably with the diversity south of the border.

The first birds available for release, like most birds received subsequently, were in relatively poor physical condition when they arrived in Arizona. People capturing thick-bills in Mexico invariably cut or pull out their primary and secondary feathers, presumably to reduce the chance of escape. Birds whose primaries have been forcibly pulled, with follicle damage resulting, invariably are unsuitable for release. Birds with cut feathers, however, usually can be rehabilitated for release.

It is often necessary to hold the birds for months in large cages until their wings have recovered. Cages provide only limited opportunities for exercising the birds. Wild thick-bills are very strong flyers, attaining speeds approaching 50 miles per hour (80 kilometers per hour) and engaging in routine foraging flights of 6 to 12 miles (10 to 20 kilometers). Although the caged birds generally fly well after release, they sometimes are not able to keep up with wild birds immediately. It generally takes them about a week in the wild to develop the flight abilities necessary to keep from lagging behind the flock. During that period, they suffer elevated risks of predation from hawks, especially the locally common Apache northern goshawk (*Accipiter gentilis apache*).

Clearly, at least one pair of thick-billed parrots bred successfully in the wild in Arizona in 1988.

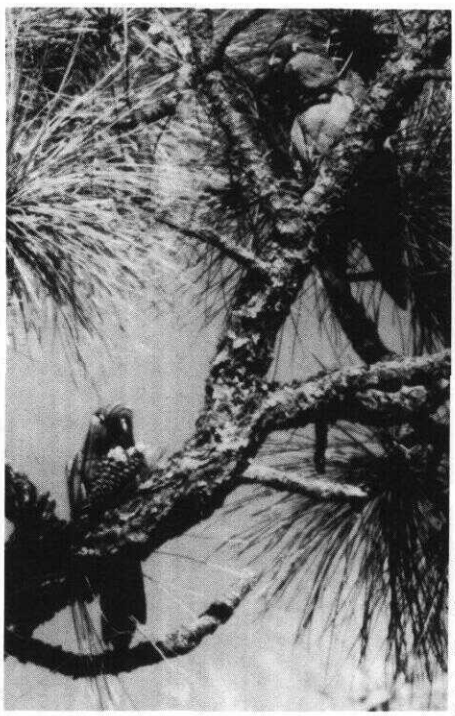

photo by Dave Daughtry

Released thick-billed parrot in the Chiricahua Mountains of southeastern Arizona, feeding on Apache pine (Pinus engelmannii) seeds

Establishing an Arizona Population

In September and October of 1986, 29 birds, some wearing radio collars, were released in the Chiricahuas (BULLETIN Vol. XI, No. 10-11). Seven of the birds were quickly lost, probably to hawks. Another eight were last observed heading toward the Mexican border. The other 14 generally stayed in the release area, except for the month of December when they were about 70 miles (110 km) to the northwest in the Graham Mountains.

In mid-June 1987, the flock, by then numbering 17 birds because of additional releases during the spring, flew at least 250 miles (400 km) northwest to summer along the Mogollon Rim of central Arizona. The flock covered considerable ground during the summer in this region, due to limited food supplies, but it apparently spent most of its time within the Tonto Basin in the central part of the State.

In late September 1987, almost exactly a year from the date of the first release, nine thick-bills returned to the original release area. A few others may have stayed in central and northern Arizona. We then released another radio-tagged bird into the flock. The group stayed together in the Chiricahuas until mid-June 1988, suffering the loss of only a single bird. During the second winter, the flock remained near the release area.

With the release of 3 more parrots in the spring of 1988, we built the Chiricahuas flock back up to 11 birds. Again in mid-June, the flock headed northwest to the Mogollon Rim. Its date of departure was only 4 days different from that of 1987. Three of the parrots, however, did not leave with the group. These birds, along with two more released in June, remained in the Chiricahuas throughout most of the summer.

The flock that flew north initially went to same area of the Tonto Basin in which it summered in 1987. Ponderosa and piñon cones were much more abundant through mid-July 1988 than they were in 1987. The flock thrived with this large food supply, and we frequently saw the birds mating. In late July and August, however, we lost track of the flock.

We received no confirmed reports of thick-bills anywhere other than the Chiricahuas until September. Then a group turned up in the same Tonto Basin area where the flock was seen in July. The group varied from 8 to 10 birds for a few weeks, then increased to 12 birds. The increase was due in part to two radio-tagged birds that had summered in the Chiricahuas and then flown more than 190 miles (about 300 km) to join this flock. The other two birds proved to be quite a different and even more exciting story.

Local residents began reporting that one, perhaps two, of the birds had pale bills—an indicator of young birds. We

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searched through October to confirm the presence of the young birds, but the flock could not be located in central Arizona's rugged pine forests and steep canyons. Then, in November, 10 birds were seen back in the Chiricahuas. Soon they were roosting and foraging at the now familiar sites. Two of the parrots had distinctly pale bills that showed very well as they begged food from their parents. Clearly, at least one pair of thick-billed parrots bred successfully in the wild in Arizona in 1988.

In the winter of 1988-1989, the young birds and the rest of the flock again wintered on the snow-covered crest of the Chiricahuas, where the conifer cone crop was very good. There are still two radio-tagged birds somewhere in central Arizona. In early February of this year, we released another radio-tagged bird, which integrated into the flock very well. Several weeks later, one of the thick-bills that had hatched in the wild disappeared from the flock, possibly taken by a predator. However, a short time later, two to four more birds returned to the Chiricahuas from parts unknown and integrated into the flock. Although it is difficult to count birds in this rugged country, we believe there are currently 11 to 13 thick-bills in the flock. All things considered, the release program for wild-caught birds is going very well.

A separate release effort, with captive-bred birds from the Jersey Wildlife Preservation Trust and the Gladys Porter Zoo, was not as successful. In late 1987, we released five of these hand-reared birds in the Chiricahuas. For 6 months the birds had been conditioned to feed on pine cones. They had ample opportunity to socialize with one another and with captive wild-caught birds throughout that period. Upon release, however, they showed no tendency to flock, and made no attempts to feed on the pines they had learned to feed upon while still in captivity. After little more than a day, it was obvious they would not form a flock or even begin feeding. We recaptured all of the birds and distributed them to various captive-breeding projects.

We also released a parent-reared bird from the Sacramento Zoo with the Jersey birds. This bird had socialized with wild-caught parrots rather than with hand-reared birds in the same cages. It soon became indistinguishable from wild-caught birds in feeding abilities and other behavior. Upon release, this parrot immediately joined the wild flock. Unfortunately, it was taken by a raptor before it could achieve full flight strength and integration with the wild flock. This suggests, though, that releases of captive-bred birds should be limited to parent-reared individuals.

Future of the Release Project

Overall, after 2 years of releasing wild-caught thick-bills, the results are encouraging. Once the birds have passed through a high-vulnerability phase immediately after release, they apparently have reasonably high survival rates. At least some of the parrots have found Arizona to be a congenial place and have established what appears to be a migratory pattern between the southeastern and central parts of the State. There have been no signs that the birds have had difficulty finding food, despite 1987 having been a relatively poor cone year for a number of dominant conifers in the region. While breeding has not yet been seen at the nests, the frequency of copulations observed in 1988 and the subsequent appearance of two young birds in the flock show that reproduction has occurred in the wild. These points all reinforce our intent to continue the release effort.

One of the questions we hope to answer with future releases is whether we can produce a less migratory flock. There is a greater diversity of conifers and oaks in southeastern Arizona than in the central part of the State. This suggests that parrots staying in the Chiricahuas might be better buffered against cone crop failures during drought cycles. If migratory patterns are largely learned behavior in thick-bills, perhaps releases of captive-reared birds in isolation from wild-caught birds could produce more sedentary populations.

The primary difficulty we have encountered since beginning this project has been obtaining adequate numbers of birds for release. While the overall smuggling of thick-bills into this country is still substantial, it is now clear that confiscations are at best an erratic source of birds and that many of the birds are in very poor condition. Very few birds came to us through Fish and Wildlife Service confiscations during 1987 and 1988. In the summer of 1988, U.S. Customs agents confiscated 37 thick-bills in Texas. Unfortunately, nine of the Texas birds died during quarantine. Further investigations revealed "parrot wasting disease" in the group. Thus, it is unlikely that we will be able to release any of these birds, if indeed any survive this currently incurable, little known disease.

The shortage of birds has been alleviated to a limited extent by donations from zoos and private breeders. Many organizations have supplied both financial support and birds for release. Most notable among these are the Jersey Wildlife Preservation Trust and (its granting arm) Wildlife Preservation Trust International, San Diego Zoo, Los Angeles Zoo, Sacramento Zoo, Gladys Porter Zoo, Arizona-Sonora Desert Museum, Bronx Zoo, and Salt Lake City Zoo. More than 300 individuals also have contributed time, money and birds. We would particularly like to acknowledge Bud Brunner, Steve Hoffman, Bill Konstant, Jim Koschmann, Dirk Lanning, Allison Leete, Chuck Rau, Mike Wallace, Jim Wiley, and Jerry and Teddy Wolcott, who have given especially generously of their time and expertise in launching the effort. The considerable support of Fish and Wildlife Service Regional Director Michael J. Spear also has been crucial to the project.

We are encouraging more organizations to participate in the breeding effort in the future. To the extent that captive-breeding projects can supply high quality, parent-reared birds, we hope to move toward larger and more regular releases in the years ahead.

Arizona citizens are contributing to the thick-bill release efforts through the State nongame tax check-off, but the support of interested people everywhere is welcome. Anyone wishing to contribute directly can send a check, made out to the Thick-billed Parrot Project, to the Arizona Game and Fish Department, Nongame Branch (Attn: Terry Johnson), 2222 West Greenway Road, Phoenix, Arizona 85023. The contributions, which are tax deductible, go into a dedicated fund used only for direct project expenses. Donors will receive periodic updates on the thick-billed parrot project.

Literature Cited

Lanning, D.V., and J.T. Shiflett. 1983. Nesting ecology of thick-billed parrots. Condor 85:66-73.

Lusk, R.D. 1900. Parrots in the United States. Condor 2:129.

Phillips, A., J. Marshall and G. Monson. 1964. The birds of Arizona. Univ. Arizona Press, Tucson, AZ.

Smith, A.P. 1907. The thick-billed parrot in Arizona. Condor 9:104.

Wetmore, A. 1935. The thick-billed parrot in southern Arizona. Condor 37:18-21.

Regional News

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Mountains. Dr. Caldwell, who is with Lincoln Memorial University, will help identify survey sites and do the field work. The Forest Service and State of Oklahoma will pay his expenses.

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The Hitchiti Experimental Forest, Oconee National Forest, and Piedmont National Wildlife Refuge in Georgia have signed the first Memorandum of Understanding for cooperative management of red-cockaded woodpeckers (*Picoides borealis*). The objective of this agreement is to increase woodpecker habitat and establish a viable population in the area. The red-cockaded woodpecker recovery plan specifies that one of the 15 viable populations needed for recovery and delisting should be located in the piedmont of North Carolina, South Carolina, or Georgia. This cooperative agreement sets population goals and establishes the pine and pine-hardwood forest acreages to be managed for the species on each property. The agencies agreed to cooperate in monitoring the population, implementing appropriate habitat management prac-

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Protection is Proposed for Butterfly and Mussel

Two rare invertebrates, an insect and a mollusk, were proposed recently by the Fish and Wildlife Service for listing as Endangered species. If these proposals become final, Endangered Species Act protection will be available to the following:

Queen Alexandra's Birdwing Butterfly (*Troides alexandrae*)

The Queen Alexandra's birdwing holds several distinctions. With a wingspan of up to 10 inches (250 millimeters), it is the world's largest butterfly. According to the International Union for the Conservation of Nature and Natural Resources (IUCN), it also is one of the world's 12 most endangered animals. On March 1, 1989, the Service proposed to list this insect formally as Endangered.

Troides alexandrae occurs only in tracts of lowland tropical rain forest within a small area of northern Papua New Guinea. This already restricted range is shrinking as native forest habitat required by the butterfly is cleared for agriculture. The region's expanding oil palm industry is the main threat to the species, although the development of cocoa and rubber plantations have contributed to the problem. Negotiations to exploit reserves of timber in the region also are under way.

Overcollecting is another danger. Birdwing butterflies in general have long been held in high esteem by insect collectors and are in great demand worldwide. Species such as *T. alexandrae*, which are not only impressive in appearance but rare and difficult to obtain, realize extremely high prices. Collecting the Queen Alexandra's butterfly is prohibited under local law and the species is on Appendix I of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES); however, some illegal trade may still occur.

Golf Stick Pearly Mussel (*Obovaria retusa*)

The latest member of North America's rich but dwindling mussel fauna to be proposed for listing as Endangered is the golf stick pearly mussel (F.R. 3/7/89). (Thirty-two mussel species in the United States already are listed.) Like other freshwater mussels, the golf stick pearly mussel (also known as the ring pink mussel) feeds by filtering particles from moving water. It has a complex reproductive cycle during which the mussel's larvae parasitize a host fish. The life span, preferred host species, and other life history aspects of the golf stick pearly mussel are unknown.

The mussel's historical range is better documented. It was distributed widely

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throughout the Ohio River and its large tributaries in Pennsylvania, West Virginia, Ohio, Tennessee, Indiana, Illinois, Kentucky, and Alabama. Currently, however, it is known to survive only in four relic populations. Two of these are in reaches of the Tennessee River (one in the State of Kentucky and one is in the State of Tennessee), the third is in a reach of the Green River in Kentucky, and the fourth is in a reach of the Cumberland River in Tennessee.

Most of the historically known populations were lost when their free-flowing river habitat was dammed to create a series of large impoundments. This not only reduced the availability of riverine gravel/sand shoal habitat preferred by the mussel but also probably affected the distribution and availability of the mussel's host fish. Other activities imperil the remaining *O. retusa* populations. The Green River population is threatened by water pollution resulting from oil and gas production and by altered stream flows from an upstream reservoir. The other three are potentially jeopardized by river channel maintenance, navigation projects, and sand and gravel dredging.

None of the four populations is known to be reproducing. Therefore, unless viable populations are discovered or methods can be developed to promote reproduction in existing populations, the species will become extinct in the foreseeable future. Further clouding the species' future is the belief that three of the mussel populations (those in the Tennessee and Cumberland Rivers) may contain only old individuals that have already passed their reproductive age.

Condor Update

The second California condor (*Gymnogyps californianus*) chick conceived in captivity emerged from its egg, assisted by staff of the San Diego Wild Animal Park, on April 19, 1989. As of April 20, the chick (whose gender will be determined later) was feeding normally and doing well. It is a sibling to Molloko, the first captive-conceived California condor, which hatched at the San Diego facility last year.

More good news is expected this summer. Three other fertile California condor eggs are being incubated, and their projected hatching dates are in mid-to-late May. Two of the eggs were laid at the San Diego Wild Animal Park. The other is from the Los Angeles Zoo, and is the first fertile egg produced by that facility's captive breeding flock. All of this year's fertile eggs are being attended by the experienced staff at San Diego Wild Animal Park; however, aviculturists and veterinarians from the Los Angeles Zoo will perform the upcoming "break-out" of the chick conceived at their facility.

This year's reproduction is important progress toward the ultimate goal of the California condor recovery program, which is to reestablish self-sustaining populations of this magnificent bird in the wild.

Protection Approved for the Alabama Canebrake Pitcher Plant

The Alabama canebrake pitcher plant (*Sarracenia rubra* ssp. *alabamensis*), a member of the family Sarraceniaceae, is an insectivorous perennial herb with red, nodding flowers and narrow, tubular leaves. This species is endemic to three counties in central Alabama, where it occurs in sandhill seeps, swamps, and bogs. It was reported historically from 28 sites, 16 of which no longer support the species. Only 4 of the remaining 12 populations are of significant size.

Most of the species' wetland habitat has been destroyed or adversely modified through clearing and drainage for agricultural use. Fire suppression also has modified the open habitat by allowing vegetational succession. As a result, as many as five pitcher plant populations have been lost through shading and overcrowding. Herbicide applications, overcollecting, and gravel mining pose additional threats.

The Fish and Wildlife Service proposed listing the Alabama canebrake pitcher plant as an Endangered species in the April 21, 1988, *Federal Register* (see BULLETIN Vol. XIII, No. 5), and the final rule was published March 10.

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tices, and implementing plans to improve effective gene flow and increase genetic diversity.

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The Fish and Wildlife Service, National Park Service, U.S. Forest Service, and several private conservation groups sponsored a cave management training seminar recently at Gatlinburg, Tennessee. Thirty-seven people directly involved in cave management or responsible for monitoring caves and cave life attended. Topics covered at the seminar included cave geology, hydrology, and mineralogy; cave-dependent bats and other cave life; recreational use of caves; use of volunteers to assist in cave protection and management; the Federal Cave Resources Protection Act; archaeological resources in caves; cave-related liability and risk management; cave gates; and cave inventory, monitoring, and management planning. This seminar was the eighth in a series that began in 1985 at Salt Lake City, Utah. The next training seminar is tentatively scheduled for October 1989 in Bend, Oregon, and will be sponsored by the U.S. Forest Service. For further information, contact Mr. Jim Nieland, U.S. Forest Service, Amboy, Washington (206/247-5473), or Mr. Robert Currie, U.S. Fish and Wildlife Service, Asheville, North Carolina (704/259-0321 or FTS 672-0321).

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The Service's Jackson, Mississippi, Field Office and the Tensas National Wildlife Refuge recently completed arrangements with Dr. Bob Hamilton of Louisiana State University, School of Forestry, Wildlife and Fisheries Management, to survey part of the refuge's forest for the Bachman's warbler (*Vermivora bachmanii*). Dr. Hamilton previously reported the warbler from this area and hopes to confirm its presence this spring.

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Region 5 — The Monongahela National Forest staff in West Virginia is doing its part to promote the recovery of the Endangered Virginia northern flying squirrel (*Glaucomys sabrinus fuscus*). All of the red spruce (*Picea rubens*) in the Forest has been mapped, and 20 sets of nest boxes have been set up to determine the general distribution of this squirrel. Boxes are being checked by wildlife students from West Virginia University. Nest boxes are also being put up and monitored in association with proposed timber sales in potential northern flying squirrel habitat. The draft recovery plan for this squirrel and another Endangered subspecies, the Carolina northern flying squirrel (*G. s. coloratus*), is under review.

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Students from West Virginia University also have been assisting with survey work for the Threatened flat-spired three-toothed snail (*Triodopsis platysayoides*). They reconfirmed this snail's presence at 3 known locations and discovered 4 new ones, all within 1 mile (1.6 kilometers) of the type locality at Cooper's Rock.

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The Maryland Natural Heritage Program has submitted a report detailing the results of its first season of field work on the harperella (*Ptilimnium nodosum*), partially supported with Endangered Species Act/Section 6 funds. The distribution, abundance, and survival of harperella populations were assessed in the report.

In September of 1988, experimental transplants of vegetative buds were made into eight sites, two of which contained natural *P. nodosum* stands. Preliminary survivorship data indicate that the apparent suitability of transplant sites varied. Some appeared to be nearly as suitable as sites in which harperella occurs naturally.

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In Virginia, The Nature Conservancy has acquired a beach site containing a large population of a rare tiger beetle (*Cicindela dorsalis dorsalis*), a category 1 listing candidate.

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The 1988 field season brought good news for the Peters Mountain mallow (*Iliamna corei*), one of our rarest species. This plant's total population in the wild consists of three genetic individuals (clones) on Peters Mountain in Giles County, Virginia. Reproductive success of these plants has been plagued by problems of flower and fruit abortion prior to seed set. This has occurred in all three individuals as well as in offspring grown from the few seeds they did produce. However, searches through the leaf litter at the Peters Mountain site by researchers from Virginia Polytechnic Institute and State University (VPI) revealed additional seeds. When grown in an experimental garden at VPI, these seeds produced plants that flowered and set fruit vigorously, producing many thousands of seeds. This work, supported largely with Section 6 funds, has contributed greatly to the species' recovery potential. A recovery plan for the Peters Mountain mallow is being prepared.

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The Service's Annapolis, Maryland, Field Office recently received a contract report from Dr. A. E. Schuyler of the Pennsylvania Academy of Sciences on the taxonomic status of two candidate plants in the genus *Bacopa*. Schuyler's study, which included herbarium and field investigations and some preliminary *ex situ* growth studies, concludes that neither *Bacopa* species merits recognition as a distinct taxon. It states that morphological distinctiveness could best be ascribed to environmental influences on these freshwater intertidal plants. These *Bacopa* species thus will be transferred to Category 3B.

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Maryland's single population of Canby's dropwort (*Oxypolis canbyi*) did not fare well in 1988. Perhaps due in part to last summer's drought, the current dropwort population consists of only seven plants. These individuals represent the only remaining population north of the Carolinas. If conditions do not improve this year, plans have been made to initiate a cultivated population. A study of the dropwort site's hydrologic regime also has been initiated.

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Region 8 (Research) — The Puerto Rico Research Group continues to monitor and manage the production of both wild and captive Puerto Rican parrot (*Amazona vittata*) flocks. In the wild, four nests had clutches and chicks during February and March. Eggs are being removed from some nests to stimulate the laying of second clutches, and chicks are being cared for temporarily at the Luquillo aviary. The captive flock produced three young Puerto Rican parrots in January, but no production has occurred there since then.

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At the Patuxent Wildlife Research Center in Laurel, Maryland, the captive whooping crane flock produced its first two 1989 eggs in mid-March.

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Region 9 (Washington, D.C., Office) — This edition of the BULLETIN begins our coverage of news from the "Washington Office," or Region 9, Division of Endangered Species and Habitat Conservation (EHC).

Most of the Service's Region 9 offices, including EHC, recently moved from various places in the Washington metropolitan area to a new location in nearby northern Virginia, and are together in one building for the first time in years. The new EHC mailing address is: U.S. Fish and Wildlife Service, Division of Endangered Species and Habitat Conservation, Room 400 — ARLSQ, Washington, D.C. 20240. *Only* special deliveries, such as overnight mail, can be accepted at the new street address (Room 400, 4401 North Fairfax Drive, Arlington, Virginia 22201).

The new telephone number for the EHC Division Chief, William Knapp, and Deputy Chief, Kenneth Stansell, is 703/358-2161. The Branch of Listing and Recovery (Janet Hohn, Branch Chief), or BLR, can be reached at 703/358-2171. Among BLR's responsibilities are: developing policy and guidelines for listing actions, recovery plans, and economic analyses of Critical Habitat designations; tracking listing actions, petitions, and recovery plans during their review in Washington; and compiling Regional selections of listing candidates. The Branch of Federal Activities (Frank DeLuise, Branch Chief), or BFA, is at 703/358-2183. BFA is responsible for,

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among other things, developing policy and regulations to implement the Endangered Species Act (particularly Section 7 interagency consultations), Fish and Wildlife Coordination Act, National Environmental Policy Act, and other laws that give the Service specific review authority. The Branch of Special Projects (E. LaVerne Smith, Branch Chief), or BSP, can be reached at 703/358-2201. BSP coordinates Service implementation of the Food Security Act (Farm Bill) and the Emergency Wetlands Act; conducts the National Wetlands Inventory; and oversees development of the Endangered Species Information System. The Controlled Correspondence Section (Denise Henne, Section Chief), at 703/358-2166, primarily is responsible for processing controlled (priority) correspondence and producing the *Endangered Species Technical Bulletin*.

To dial these numbers through FTS, omit the area code and substitute 921 for the 358 prefix.

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Beginning with next month's BULLETIN, reports on EHC activities of general interest will be a regular feature of this column. We also plan to highlight news from other Region 9 offices, such as the Office of Management Authority, Division of Federal Aid, and Division of Law Enforcement, on their activities that contribute to endangered species conservation.

BOX SCORE OF LISTINGS AND RECOVERY PLANS

Category	ENDANGERED U.S. Only	ENDANGERED U.S. & Foreign	ENDANGERED Foreign Only	THREATENED U.S. Only	THREATENED U.S. & Foreign	THREATENED Foreign Only	SPECIES* TOTAL	SPECIES WITH PLANS
Mammals	31	19	240	5	2	23	320	24
Birds	61	15	145	7	3	0	231	57
Reptiles	8	7	59	14	4	14	106	22
Amphibians	5	0	8	4	0	0	17	5
Fishes	45	2	11	24	6	0	88	47
Snails	3	0	1	5	0	0	9	7
Clams	32	0	2	0	0	0	34	22
Crustaceans	8	0	0	1	0	0	9	4
Insects	10	0	0	7	0	0	17	12
Arachnids	3	0	0	0	0	0	3	0
Plants	152	6	1	40	6	2	207	84
TOTAL	358	49	467	107	21	39	1041	284 **

Total U.S. Endangered **407**
Total U.S. Threatened **128**
Total U.S. Listed **535**

Recovery Plans approved: 242

*Separate populations of a species that are listed both as Endangered and Threatened are tallied twice. Those species are the leopard, gray wolf, grizzly bear, bald eagle, piping plover, roseate tern, Nile crocodile, green sea turtle, and olive ridley sea turtle. For the purposes of the Endangered Species Act, the term "species" can mean a species, subspecies, or distinct vertebrate population. Several entries also represent entire genera or even families.

**More than one species are covered by some recovery plans, and a few species have separate plans covering different parts of their ranges. Recovery plans are drawn up only for listed species that occur in the United States.

Number of Cooperative Agreements signed with States and Territories: 51 fish & wildlife
April 30, 1989 *36 plants*

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ENDANGERED SPECIES

Technical Bulletin

Department of the Interior, U.S. Fish and Wildlife Service, Washington, D.C. 20240